



A Networked Conveying System using Hybrid Control under Distributed Network

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In this research, we propose a networked conveying system which consists of multiple arrays of cells as shown in Figure 1 and figure 2. Each cell is a wheel driven by a two degree-of-freedom mechanism. The direction and velocity of cell are controlled based on the concept of hybrid control under a distributed network. Each cell has its own controller under a subsumption architecture for low-level control. A cell communicates with its four neighboring cells to manipulate a targeted object towards its desired position. The high-level control assigns a desired position and direction of the object to each cell. The path of each object is then generated by many supporting cells. Moreover, the networked conveying system can handle multiple objects simultaneously.

The networked conveying system has several advantages over conveyor belts and conventional robot manipulators. It provides simultaneous transportation of multiple objects on individual trajectory. These include feeding, orientating, sorting, separating, and arranging objects.

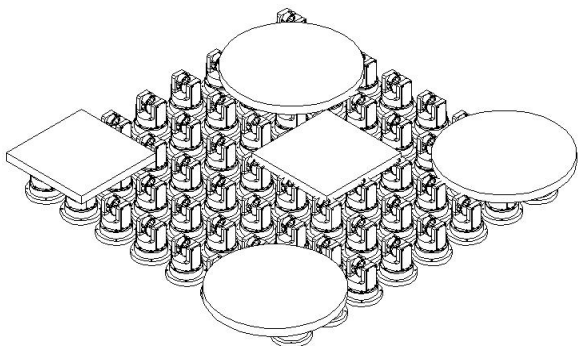


Figure1. Structure of networked conveying system

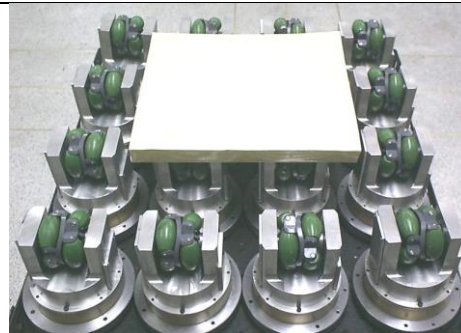


Figure2. Prototype of networked conveying system

To study the networked conveying system, a GUI-based simulator of networked conveying system is constructed.

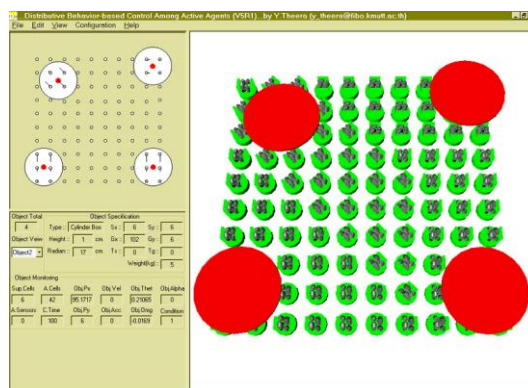


Figure 3. GUI-based simulator of networked conveying system

Figure 3 illustrates a GUI-based simulator using the proposed concept, which can manipulate multiple objects simultaneously. This simulator is developed under the Windows-based operating system using the Microsoft Visual C++.

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